



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/770,893	02/03/2004	Shihong Gary Song	EH11083U; 67097-022	1084

26096 7590 05/27/2010
CARLSON, GASKEY & OLDS, P.C.
400 WEST MAPLE ROAD
SUITE 350
BIRMINGHAM, MI 48009

EXAMINER

KESSLER, CHRISTOPHER S

ART UNIT	PAPER NUMBER
----------	--------------

1793

MAIL DATE	DELIVERY MODE
-----------	---------------

05/27/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/770,893
Filing Date: February 03, 2004
Appellant(s): SONG, SHIHONG GARY

Matthew L. Koziarz
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5 March 2010 appealing from the Office action mailed 2 April 2009.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

The instant application was previously appealed on 22 January 2008, but no decision was issued due to Appellant's subsequent filing of an RCE.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1-16 and 26-29 are rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being

Art Unit: 1793

maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

6,248,453	Watson	6-2001
4,713,216	Higashi	12-1987
EP 570911 A1		11-1993

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4, 10-13, 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson.

Watson teaches an aluminum alloy with high strength and excellent thermal stability (column 4 line 31) comprising 10-70 vol % $Al_3X L_{12}$ formers including Er, Yb, Ti (column 3 lines 5-8, column 6 lines 11-15), and ≥ 1 wt% one or more of Mg, Ag, Zn, Li, and Cu (column 2 lines 35-54) which form solid solution matrix with aluminum. Watson teaches that a plurality of dispersion particles form from said added elements, namely $Al_3X L_{12}$ particles are formed (abstract, etc). Though Watson teaches a preferred

Art Unit: 1793

embodiment of 3-16 wt% Sc, 3-6% Mg, 2-5% Zr, and 0.1-4% Ti (column 2 lines 10-11), Watson teaches that all of Ti, Zr, Sc are L1₂ formers, as well as Er and Yb; and can be substituted for one another (column 3 lines 5-8). It would have been obvious to replace Sc with Er and Yb, because it is prima facie obvious to substitute equivalents known for the same purpose, see MPEP 2144.06. Therefore, the composition taught by Watson overlaps the presently claimed ranges of Yb and Er, as well as 1 + minor element selected from Ti, Mg, Ag, Zn, and Cu (cl. 1-4, 10-13, 26-29).

Regarding claims 10-13, Watson further teaches the alloy can be used for gas turbine engines where low weight is required and temperatures are on the order of 300°C (column 5 lines 46-50).

The ranges taught by Watson overlap the instantly claimed ranges, establishing a prima facie case of obviousness for those ranges. It would have been obvious to one of ordinary skill in the art at time of invention to have selected a composition within the ranges as claimed, because Watson teaches the same utility over overlapping ranges. Applicant is further directed to MPEP § 2144.05. Additionally, "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages," In re Peterson, 65 USPQ2d at 1379 (CAFC 2003).

Claims 1-5, 7, 8, 10-16, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi.

Higashi teaches an aluminum alloy with excellent properties comprising 0.5-10% total one or more RE elements including Gd, Er, Yb, and Y (column 2 lines 31-32, 51)

Art Unit: 1793

in order to improve the resistance to stress and corrosion and improve workability of said aluminum alloy (column 2 lines 38-40, 54-57), which is a close approximation of "greater than 10% weight" total of 1st and 2nd RE elements in instant claims 1, 4, 5, 7, 8, 10, 13-16. Said alloy also contains Zn, Mg, Mn, Cu in ranges that fall within the claimed "at least one minor element" ranges of instant claims 2, 3, 11, 12, 28, 29 (see Table 4, Higashi at cl. 1 and 2).

Though Higashi does not specify that particles/precipitates are formed from said RE additives, Higashi does teach precipitation age hardening in said examples.

Because the composition taught by Higashi is a close approximation of the presently claimed composition, and because Higashi teaches precipitation age hardening step, then substantially the same precipitates are expected to form as in the instant case.

Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Concerning claims 10-16, though Higashi does not mention using said alloy for gas turbine engine components, it would have been obvious to one of ordinary skill in the art to form the alloy taught by Higashi into gas turbine engine component, because Higashi teaches the Al-RE alloy has excellent mechanical properties, and improved resistance to stress and corrosion (column 2 line 40).

Art Unit: 1793

Claims 1-3, 7-12, 15, 16, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '911.

EP'911 teaches an aluminum alloy composition with $Al_aFe_bRE_cMn_d$, wherein $a = 85-95$ at%, $b = 2-8$ at%, $c = 1-6$ at%, $d = 0.5-6$ at%, and RE includes at least one element selected from a markush group including Y and Gd (page 3 lines 12-15), which overlaps the composition in claims 1-3, 7-12, 15, 16, 26. The composition of claim 9 of: 13-16 wt% Gd and approx. 4 wt% Y, converts to: 2.6-3.3 at% Gd and approx. 1.4 at% Y, balance aluminum, which falls within the alloy taught by EP'911. EP'911 further teaches intermetallic compounds are formed w RE elements, thereby resulting in increased hardness, strength, and toughness (column 2 line 25-26). Though EP'911 does not specify the addition of at least one minor element such as Mg (or Cu, Zn, Ag, Mg, Sn, Ti, Co, Ca) in claims 1, 3, 10, 12, 27, the instant claims do not recite a minimum amount of said element(s), and therefore inevitable impurity amounts of said element(s), inherently expected in the prior art, are held to meet said claim limitation.

Because EP'911 teaches an overlapping alloy composition, it is held that EP'911 has created a prima facie case of obviousness of the presently claimed invention. Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05.

Concerning claims 10, 12, 15, 16, though EP'911 does not mention using said alloy for gas turbine engine components, it would have been obvious to one of ordinary skill in the art to form the alloy taught by EP'911 into gas turbine engine component,

Art Unit: 1793

because EP'911 teaches the A1-RE alloy has excellent mechanical properties, such as increased hardness, strength, and toughness (column 2 line 25-26).

Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson in view of Higashi.

Regarding claim 5, The teachings of Watson are detailed above. Watson does not teach wherein the alloy comprises the rare earth element yttrium.

Higashi teaches an aluminum alloy with excellent properties comprising 0.5-10% total one or more RE elements including Gd, Er, Yb, and Y (column 2 lines 31-32, 51) in order to improve the resistance to stress and corrosion and improve workability of said aluminum alloy (column 2 lines 38-40, 54-57). Higashi further teaches that the preferred elements are Y, La, Ce, Pr Nd or Sm, and that the preferred amount of said elements is 4.0-6.0% (see col. 2), said range overlapping the instantly claimed range and establishing a prima facie case of obviousness. It would have been obvious to one of ordinary skill in the art at time of invention to have selected an amount of yttrium within the ranges as claimed, because Higashi teaches the same utility over an overlapping range. Applicant is further directed to MPEP § 2144.05.

It would have been obvious to one of ordinary skill in the art at time of invention to have altered the alloy of Watson by adding Yttrium, as taught by Higashi, in order to provide a high resistance to stress and corrosion, as taught by Higashi (see col. 2).

Regarding claim 6, Watson teaches that the composition includes 10-70 vol% Al_3X phase, and that said phase is formed from one or more of Sc, Er, Lu, Yb, Tm and

Art Unit: 1793

U (see cl. 1). Thus, the range of Yb in Watson overlaps the instantly claimed range, establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have selected a composition within the ranges as claimed, because Watson teaches the same utility over overlapping ranges. Applicant is further directed to MPEP § 2144.05. Further, it would have been obvious to one of ordinary skill in the art to have substituted Yb for Sc in the preferred composition of Watson, because Watson teaches that these two elements are each L1₂ formers (see col. 3 and claim 1). Applicant is further directed to MPEP 2144.06.

(10) Response to Argument

Appellant argues that the examiner has taken the teachings of Watson out of context, and that Watson requires scandium, or as more particularly stated at p. 4, “However, Watson as a whole is explicitly limited to alloys that include scandium.” The examiner disagrees for two reasons. Firstly, the examiner disagrees with Appellant’s characterization of Watson. Watson at col. 2 (as cited by Appellant) states:

Art Unit: 1793

According to the present invention, an aluminum alloy containing a dispersion of particles having $L1_2$ structure is described. The alloy is processed by rapid solidification. Al_3Sc is an example of an $L1_2$ compound which may be dispersed in an aluminum solid solution matrix.

Watson further in col. 2 states:

The present invention includes compositional, microstructural, and processing aspects. A broad exemplary range for an alloy according to the present invention includes 3-16 wt. % scandium, 3-6 wt. % magnesium, 2-5 zirconium, and 0.1-4 wt. % titanium.

An alloy of aluminum containing 3-16% Sc is a model alloy for explaining this invention.

Thus one of ordinary skill in the art would recognize that Watson refers to an “example” of an alloy (or “exemplary” alloy) containing scandium, not that the invention is “based” on a scandium alloy as appellant suggests. Watson quite clearly describes the Al-Sc alloy as being a “model alloy for explaining the invention,” rather than the invention itself. The abstract of Watson as well as the claims do not require the presence of Sc (see abstract and claim 1 of Watson). Appellant’s interpretation that Sc is required in Watson is simply not supported by the full disclosure of Watson. Secondly, even if Watson requires the presence of Sc in the alloy (an argument which is not conceded by the examiner), the teaching of Watson that other elements are equivalent $L1_2$ formers (as cited in grounds of rejection above) is not negated by the required presence of Sc. Appellant has not explained how the substitution of an equivalent functional element (as taught by Watson) would be incorrect. Instead, appellant has merely argued that Watson requires Sc and thus no equivalents could have been used by one of ordinary

Art Unit: 1793

skill in the art. Appellant's conclusions lack substance from either of a legal or a technical basis.

Appellant argues that Higashi teaches away from the claimed composition of greater than 10%. Appellant also argues that the claimed amount of greater than 10% is not close enough to the teachings of the prior art of up to 10% to establish a prima facie case of obviousness for that reason. The examiner disagrees with this characterization of Higashi. Higashi at col. 2 teaches that the composition of greater than 10% rare earth elements has the same properties as the composition taught by Higashi of 0.5-10.0%, and the additional amount of rare earths is "wasted." This is not a teaching away, as there is no undesirable property or result taught by Higashi for using more than 10% rare earth. One of ordinary skill in the art would have expected the claimed composition to have the same properties as the composition of Higashi, because Higashi says that they will have the same properties.

Appellant argues that the inevitable impurities of aluminum alloys would not have been inherently present in the aluminum as described in EP '911, and that the examiner cannot "pick and choose" which impurities would have been present. However, these elements would have been present in trace amounts as inevitable impurities in the aluminum. ASM handbook as was described by the examiner shows that the elements are present in nominally pure aluminum. This is evidence of inherency. Appellant has not provided any evidence that the elements would not have been inherent, but just arguments to that effect. The inevitable impurity elements in the aluminum read on the limitations of the claims, which do not recite any minimum amount for said elements.

Art Unit: 1793

Appellant argues that claims 5 and 6 are improperly rejected because there is no suggestion from the Watson reference that erbium, ytterbium and scandium are equivalent elements. The examiner disagrees with appellant's arguments for the reasons stated above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Christopher Kessler/

Examiner, Art Unit 1793

Conferees:

/Stanley Silverman/ ss

Supervisory Patent Examiner, Art Unit 1793

/ Roy King/ rvk

Supervisory Patent Examiner, Art Unit 1793